Bilateral vertebral artery dissection and cerebellar stroke: a rare complication of massage

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In vertebral artery dissection (VAD), a tear occurs in the intimal wall of the vertebral artery. The tear can be either spontaneous or traumatic and allows blood to collect in the wall of the vessel as an intramural haematoma.1 This can result in either direct haemodynamic compromise of the artery or thromboembolism affecting a downstream vessel.2 As the vertebral arteries supply the posterior circulation of the brain, a significant consequence of this pathology can be cerebral ischaemia and stroke.1 Many accounts of VAD have been published supporting the aetiology of this condition as a result of high-velocity forces affecting the cervical spine. Here, we present a case supporting potential aetiology arising from a low-energy intervention to a patient’s neck.

Case report

A 39-year-old male presented to our emergency department (ED) after a one-day history of bitemporal, gradual-onset headache with associated nausea and vomiting. He also complained of posterior neck pain, which had started suddenly during a massage two days prior to presentation. His past medical history consisted only of common migraine; however, this presentation was atypical of his usual migraine attacks. The patient did not report any fevers, photophobia, vertigo, abdominal pain or other gastrointestinal symptoms.

The patient was an ex-smoker, self-employed chef, living independently with his wife and child, with no significant family history. Of note, he regularly received Thai massage.

On physical examination, the patient was apyrexial, with a blood pressure of 150/90mmHg, heart rate of 103bpm, respiratory rate of 18bpm and oxygen saturation of 99% on room air. He was alert and oriented and had no dysarthria. His abdomen was soft and non-tender. He had a full, pain-free, cervical range of motion without any stiffness or midline cervical spine tenderness. The cranial nerve examination was unremarkable and he had normal peripheral tone, power, sensation and deep tendon reflexes. On cerebellar examination, the patient demonstrated left-sided past pointing and an ataxic gait, falling to his left side on ambulation.

ABSTRACT

Dissection of a cervical artery is a well-known cause of stroke, especially in younger patients. We describe the case of a 39-year-old male, who presented to our emergency department after a one-day history of headache and vomiting, with associated sudden onset posterior neck pain and cerebellar signs following a massage. Computed tomography angiogram and brain demonstrated bilateral vertebral artery dissection and cerebellar stroke. He was admitted to hospital for monitoring and conservative management with antiplatelet therapy, resulting in a good outcome. This is the first reported case of bilateral vertebral artery dissection and stroke to be associated with massage. This case also suggests, unlike many reports in the literature, that significant vascular pathology can result from massage even without cervical spine manipulation.
Blood results showed an unremarkable urea electrolytes and creatinine (UEC), however a full blood examination (FBE) was notable for a white cell count of 14.7x10^9/L (normal range 4.0–11.0), with a predominant neutrophilia.

Investigation with computed tomography (CT) angiography demonstrated bilateral dissection of the cervical segments of the vertebral arteries, with complete occlusion of the left vessel, as well as evolving infarction of the left cerebellar hemisphere. These findings were confirmed on magnetic resonance imaging (MRI) of the brain and cervical arteries (Figures 1–3).

The patient was commenced on anti-platelet therapy in ED with aspirin 300mg loading dose. He subsequently was admitted under the stroke unit for medical management, with ongoing daily aspirin (100mg) and atorvastatin (80mg). Following a four-day admission, including intensive physiotherapy, he was discharged home.

At six-month follow-up, the patient had remained symptom-free, with complete recovery of his abnormal neurological findings, allowing him to return to his normal work. Repeat MRI demonstrated significant improvement in the vertebral arteries and appropriate evolution of the stroke.
Figure 2: MRI angiography (maximum intensity projection) of the vertebral arteries. Narrowing of the vertebral artery lumens bilaterally with no flow above dissected segment on left (arrow).

Figure 3: MRI brain T2 TSE TRA, axial-section. Left cerebellar acute infarct.
Discussion

Dissection of a cervical artery is a major cause of stroke in young patients, and is reported to cause up to 25% of strokes in patients under 45 years old.1 Trauma is the most significant predisposing factor for VAD,3 which can range from sporting injuries to high-speed motor vehicle accidents. The pathology has also previously been associated with cervical manipulation therapy, as performed by chiropractors.1 Other risk factors include hypertension, migraine, use of oral contraceptives and connective tissue disorders.1,3 Our patient had several of these risk factors.

Our review of the PubMed® database using the search terms ‘massage’ and ‘vertebral artery dissection’ revealed only two similar cases, reported in China4 and India.5 We believe that this is the first reported case of bilateral vertebral artery dissection and stroke to be associated with massage. It is also the first case of VAD associated with massage reported in Australasia.

Massage is a common alternative medicine, which is gaining popularity in New Zealand.4 National regulation of the industry however remains limited, with no mandatory licensing or registration requirements.6,7 As a result, some massage therapists may have no qualifications or limited experience.

Our case is notable as unlike most reported cases of VAD, massage typically does not involve the application of high-velocity force to the neck or manipulation of the cervical spine. This suggests that the even application of low-energy therapies to the neck, such as massage or stretching, could result in this vascular pathology, which could potentially be fatal.1

For young patients presenting with a syndrome consistent with a posterior circulation stroke, VAD is a significant differential diagnosis, especially in the presence of neck pain or recent trauma. This should include possible low-energy mechanisms of injury including massage. If clinicians are suspicious of this pathology, they should proceed to urgent CT or MRI angiography.3

Vertebral artery dissection is typically treated conservatively, with either anti-platelet or anticoagulant therapy. This aims to reduce thrombus propagation and embolism to prevent stroke.1,8 Thrombolysis can be considered for acute ischaemic stroke, without significant risk of expansion of the intramural haematoma.8 There are also case reports of successful endovascular stenting to restore perfusion through an occluded vertebral artery.7

Conclusion

Vertebral artery dissection is an important cause of stroke in young patients. This case suggests that the application of even low-velocity force to the cervical spine can cause significant vascular injury. Massage is a common alternative therapy, and may be a previously underappreciated contributing factor for this pathology.

Competing interests: Nil.

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